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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,236	03/08/2004	Guanghua G. Zhang	PEN-106/US	2183

7590 08/03/2005

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EXAMINER

AKANBI, ISIAKA O

ART UNIT PAPER NUMBER

2877

DATE MAILED: 08/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/796,236

Applicant(s)

ZHANG ET AL.

Examiner

Isiaka O. Akanbi

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35-37 is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement file 08 February 2004 has been entered and reference considered by the examiner.

### ***Drawings***

2. The examiner approves the drawings filed 08 February 2004.

### ***Claim Rejections - 35 USC § 112***

3. Claim 11 recites the limitation "said axis." The examiner assumes the broadest reasonable interpretation per the above claim language as to where the elongated object is perpendicular to the surface.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4, 5, 9, 10, 31 and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Sheridan (6583869). The reference of Sheridan discloses the features of the claimed as follows:

Regarding claims 1 and 31, Sheridan discloses apparatus/method (Col. 6, line 21-24) for determining orientation/inclination angle  $\theta$  between an axis of an elongate object (1) contacting a plane surface (2) with a tip and a normal to plane surface (12) comprising the steps of (See Col. 6, line 25-47):

- a source (7) to illuminating said plane surface with a probe radiation from said elongate object (1) and at an angle  $\sigma$  to said axis, specifically, Sheridan clearly represent in Fig. 4 a source which provides a predetermined radiation pattern to a point on a plane surface.
- detector (9) detecting a scattered portion of said probe radiation returning from said plane surface to said object to a second point of view;
- a unit for determining said at least one orientation parameter from a difference between said probe radiation and said scattered portion (Col. 6, line 32-46).

As to claim 2, according to claim 1, Sheridan discloses wherein at least one orientation parameter (3a) comprises an inclination angle  $\theta$  between an axis of said elongate object and a normal to said surface at said contact point (Col. 6, lines 36-44).

As to claim 4, Sheridan discloses wherein plane surface (2) See Fig. 1.

As to claim 5, Sheridan discloses predetermined pattern by using radiation see fig. 4. Radiation, itself, is defined as an unstable entity: thus, satisfying the applicant's language wherein the predetermined pattern is asymmetric. Asymmetry is defined as something being unbalanced or without symmetry. Continuing, an unbalanced entity is also defined to be unstable, wherein radiation parallels thusly.

As to claims 9 and 10, Sheridan discloses elongate object (1) that includes a robotic arms (col. 7, line 32-36) is a jotting implement (i.e. stylus)(see fig. 1).

As to claim 32, Sheridan discloses a predetermined pattern that is scan pattern see fig. 4. Scan as defined is to examine systematically with a sensing device (as a photometer or a beam of radiation) which is synonymous to Sheridan's fig. 4.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3, 6-8, and 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sheridan (6,583,869) in view of Lange et al. (10/217,945).

As to claim 3, Sheridan fails to disclose wherein said at least one orientation parameter further comprises a roll angle  $\psi$  around said axis. Lange discloses wherein at least one orientation parameter further comprises a roll angle  $\psi$  (3) around said axis See Fig. 10. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to incorporate the teachings of Sheridan in conjunction with Lange to determine a roll angle of the desired position and orientation (3b) when the hole to be drilled is not perpendicular to the surface.

As to claim 6, Sheridan continues to disclose wherein the said unbalance/unstable pattern, which reads on claim "an asymmetric pattern" is selected from the group consisting of line sets, ellipses, rectangles and polygons. Lange discloses a slightly round beam pattern (col. 7, line 44-51) is not perfectly round, thus display a slight irregular pattern. Therefore, it would have been obvious to a person skill in the art to modify Sheridan in view of Lange to produce wherein radiation emitted from the emitter/projector will comprise of an unbalance/unstable pattern in the form of irregular circular/round pattern.

As to claim 7, Sheridan fails to disclose wherein said projector comprises a structured light optic for projecting said probe radiation onto said plane surface in said predetermined pattern. Lange discloses a target optical element with a pattern generator radiating onto a plane surface (Fig.1 and col. 8, line 5-11). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to

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incorporate the teachings of Sheridan in conjunction with Lange to determine a roll angle reference pattern.

As to claim 8, Sheridan fails to clearly disclose wherein the selected group consist of holographic elements, diffractive elements, refractive elements and reflective elements. Lange discloses in col. 8, line 5-17 a pattern generator that generate a diffractive optical element (DOE) as well as reflected beam element. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify Sheridan in view of Lange in order to provide an apparatus to determine a roll angle using diffractive and reflective elements.

As to claim 34, Sheridan does not explicitly/clearly disclose wherein said at least one orientation parameter comprises at least one Euler angle. The examiner interpretation of Euler angle as defined is relative orientations of orthogonal coordinate systems which is synonymous to Sheridan's fig. 1. Therefore, at the time of invention, it would have been obvious to one having ordinary skill in the art to modify Sheridan in view of the examiner's interpretation by determining a first position and orientation of the plane surface relative to that of the object.

***Allowable Subject Matter***

6. Claim 11-30 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

As to claims 11-30, the prior art of record, taken alone or in combination, fails to disclose or render obvious a predetermined scatter angle  $\zeta$  to said axis, further the prior of the record fails to disclose a timing unit for deriving said at least one orientation parameter from a detection time of said scattered portion.

7. Claims 35-37 are allowed over the prior art of record.

Regarding claims 35-37, the cited claim language is allowable over cited prior art base on the evidence that the art fails to disclose predetermined scatter angle to said axis with said detector, further the prior of the record fails to disclose a timing unit for deriving said inclination angle  $\theta$  from a detection time of said scattered portion

***Conclusion***

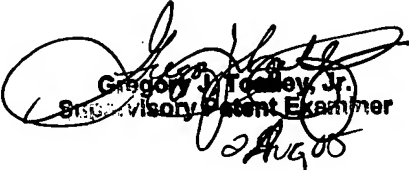
**Fax/Telephone Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isiaka Akanbi whose telephone number is (571) 272-8658. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Gregory D. Talley, Jr.  
Supervisory Patent Examiner  
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